Appendix D
Minimization and/or Mitigation Summary

Table Appendix D-1: Summary of Impacts and Proposed Mitigation Measures

Impact Category	Impact	Proposed Avoidance, Compensation, and Minimization Measures
Utilities	**Impact UTIL 1**: Construction could also temporarily disrupt traffic circulation patterns on Red Top Road, Abernathy Road, Business Center Drive, Suisun Valley Road and Rockville Road including increased congestion of affected roadways during construction and disrupted access to businesses along Russell and Abernathy Road. Access to residential properties along Kaiser Drive and Abernathy Road would also be temporarily affected during construction of the new roadway. During project construction, police and emergency services may be temporarily disrupted as a result of traffic delays, temporarily closed roads, and detours routes. Access to business and residences in the East End may be temporarily affected as a result of construction activities. The construction for each project section is estimated to take approximately six to nine months. The construction time would vary depending upon the final staging plan for the work. This impact is considered significant because such delays can affect emergency services response times as well as result in temporary businesses disruptions.	**Mitigation Measure UTIL 1**: A traffic management plan (TMP) shall be implemented during construction. The TMP shall be consistent with County and Caltrans roadway construction guidelines and identify the locations of temporary detours and signage to facilitate local traffic patterns and through-traffic requirements. Except in emergencies, I-80 ramp closures (if necessary) will occur only during nonpeak hours and likely only at night; any ramp closure will comply with Caltrans ramp closure chart. Daytime access to businesses will be retained during construction. To the extent that business access must be disrupted, the disruption will occur only at night. Access to residences Kaiser Drive and Abernathy Road will be maintained during construction. Affected businesses and residences shall be notified at least 1 week in advance of any lane or roadway closures or impacts related to access. Emergency service providers, such as fire and police protection, shall be notified 1–2 weeks in advance of any lane or roadway closures so that alternate routes can be taken.
Traffic/Safety	**Impact TRAF1**: A small portion of the Fairfield Linear Park Bicycle Trail along the west side of Suisun Creek would be replaced and depressed to cross under the new bridge that would span Suisun Creek.	**Mitigation Measure TRAF 1**: Directional bicycle signs shall be installed prior to construction. The signs shall demarcate alternative routes, and shall be continuous and consistent with the City of Fairfield and Solano county Bicycle Plans, paths, lanes and routes.
	Impact TRAF 2: A new intersection would be construction at the Red Top Road/ North Connector, potentially impacting and existing bicycle path located north of SR12 West.	**Mitigation Measure TRAF 2**: The bike path at the Red Top Road/ North Connector intersection shall remain 12 feet wide. Coordination with the City of Fairfield shall take place to provide proper signage and a controlled turning movement for right turns for bicyclists at this intersection.
Land Use	**Impact LU 1**: The proposed project would bisect the Mangels Property, currently being used for limited cattle ranching and agriculture. Access to the Ditmer Property would also be severed by the new road and would be	**Mitigation Measure LU 1**: The project shall provide an under crossing to allow movement of livestock and tractors on the Mangels Property.

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	replaced with a new driveway off of the roadway.	
	Impact LU 2: The project would conflict with applicable local and regional agricultural polices. Policy LU 2.1 states that the City shall "Encourage the preservation agricultural land surrounding the City in the Suisun Valley." The East End is zoned Exclusive Agriculture by the Solano County General Plan. The construction of a new roadway would result in direct take of land ranging from 24.79 to 27.0 acres of prime agricultural land.	**Mitigation Measure LU 2**: The STA shall be required to replace Prime Farmland at a 1:1 ratio with agricultural land of equal quality and shall be required to protect the land for agricultural use through agricultural conservation easements. All easement acquisitions shall conform to the policies of the Final Agricultural Conservation Easement Plan (Prepared for Solano Land Trust, August 2002).
	Impact LU 3: The alignment in the East End would result in impacts to Prime Farmland. The City of Fairfield's General Plan Agriculture Element and Solano County's General Plan Land Use Element include goals, objectives, policies, and programs which relate to the preservation of farmland. The removal of prime agricultural land from production, as would take place under the Ease End alignment, would not be consistent with policies regarding the preservation of agriculture in the City of Fairfield and Solano County General Plans.	**Mitigation Measure LU 3**: Parcels designated Prime or Unique Farmlands as designated by the Natural Resources Conservation Service that are affected by the project (right of way acquisition required) shall be evaluated to determine if the remainder parcel is of adequate size for continued agricultural use. This determination shall be based on discussions with the property owner and on the County's farmable unit criteria. If the remainder parcel is not considered farmable by the property owner, and does not meet the County's farmable unit criteria, the STA/County shall consider purchasing the remainder parcel for assembly with adjacent farmlands.
	Impact LU 4: The project would result in the conversion of prime farmland and conflict with parcels zoned Exclusive Agriculture and parcels under Williamson Act Contract. The direct take of agricultural land is 26.15 acres. There would also be an indirect take of agricultural land – where the utility of agricultural land is diminished due to segmentation of a parcel.	**Mitigation Measure LU 4**: Parcels under current Williamson Act Contracts (or Prime or Unique Farmlands as designated by the Natural Resources Conservation Service) that are affected by the project (right of way acquisition required) shall be evaluated to determine if the remainder parcel is of adequate size for continued agricultural use. This determination should be based on discussions with the property owner and on the County's farmable unit criteria. If the remainder parcel is not considered farmable by the property owner, and does not meet the County's farmable unit criteria, the STA/County shall consider purchasing the remainder parcel for assembly with adjacent farmlands.
	Impact LU 5: The project would temporarily impact the Fairfield Linear Park bicycle path at Abernathy Road and Suisun Creek. This would conflict with the Solano County General Plan, Objective 3: "Establish a system of trails,	

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	bikeways, and walkways as an alternate mode of travel which would provide convenient and safe movement of non-motorized traffic. Circulation Element." A 4(f) document was prepared for this project to analyze impacts to the Fairfield Linear Park and is included in Appendix B.	
Aesthetics	**Impact VIS1**: The road widening, signalization and development of a new road over rolling grasslands would substantially change the rural character of this area.	**Mitigation VIS1a**: In areas of rolling grasslands, contour grading would be utilized to minimize alteration of the natural terrain. Slope rounding would also be employed in conjunction with contour grading as to provide a smoother and more natural appearing finished grade and smoother transition between grade slopes and natural topography. **Mitigation VIS1b:** Replacement landscaping would be minimal and native species would be used to reflect the rural character of the surrounding areas. Graded slopes would be re-seeded with native grasses.
	Impact VIS2: The proposed project would involve grading activities and hillsides, and the potential for car lights to show on residences.	**Mitigation VIS2:** Mitigation measures VIS1a and VIS1b (listed above) should also be applied to roadway development in this landscape unit to reduce long-term visual impacts of the new roadway.
	Impact VIS3: East of Suisun Creek, the alignment would result in introducing new roadway facilities into an area that exhibits a fairly intact agricultural aesthetic.	**Mitigation Measure VIS3:** The alignment east of Suisun Creek should be constructed with minimal landscaping and no curb or gutter to provide a more rural character. Roadside ditches or drainage swales would be used to control runoff. Landscaping would include simple grasses and low shrubs so that views to the north are not blocked from I-80, from the Linear Park Bicycle Path, or for motorists traveling on the North Connector.
	Impact VIS4 Visual Quality: The road widening, signalization and development of a new road over rolling grasslands could substantially change the rural character of this landscape unit. Mitigation Measure VIS1a and VIS1b (listed above) would reduce this potential impact.	**Mitigation Measure VIS4:** The eastern alignment of Suisun Creek should be constructed with minimal landscaping and no curb or gutter to provide a more rural character. Roadside ditches or drainage swales should be used to control runoff. Landscaping should include simple grasses and low shrubs so that views to the north are not blocked from I-80, the Linear Park Bicycle Path or for motorists traveling on the North Connector. Mitigation Measure VIS4 would reduce this potential impact to a less than significant impact.

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Cultural Resources	**Impact CUL1:** The proposed project may result in the discovery of human remains.	**Mitigation Measure CUL1:** The County Coroner, upon recognizing the remains as being of Native American origin, is responsible to contact the Native American Heritage Commission within 24 hours. The Commission has various powers and duties to provide for the ultimate disposition of any Native American remains, as does the assigned Most Likely Descendant. Sections 5097.98 and 5097.99 of the Public Resources Code also call for "protection to Native American human burials and skeletal remains from vandalism and inadvertent destruction." A combination of preconstruction worker training and intermittent construction monitoring by a qualified archaeologist would serve to achieve compliance with this requirement for protection of human remains. Worker training typically instructs workers as to the potential for discovery of cultural or human remains, and both the need for proper and timely reporting of such finds, and the consequences of failure thereof.
	Impact CUL2: The proposed project may result in the discovery of paleontological resources.	**Mitigation CUL2:** In accordance with CEQA Section 15064.5, should previously unidentified paleontological resources be discovered during construction, the project sponsor is required to cease work in the immediate area until such time as a qualified paleontologist can assess the significance of the find and make mitigation recommendations, if warranted. To achieve this goal, the contractor shall ensure that all construction personnel understand the need for proper and timely reporting of such finds and the consequences of any failure to report them. The implementation of this mitigation measure would reduce the impacts associated with paleontological resources to a less-than-significant level.
Hydrology/ Drainage	**Impact HYD 1:** The proposed project shall include a clear-span bridge (approximately 40 feet in length) at Suisun Creek. The proposed bridge shall span the creek and would not encroach into the 100-year floodplain, and therefore no contraction, abutment, or pier scour is anticipated beyond existing conditions. The proposed bridge would be designed as concrete girder, free-span structures set above the 50-year flood elevation and would not have piers extending into the channel. The bridge is being designed to Solano County standards, which are the 50 year storm + 2 years or the 100-year flood.	**Mitigation Measure HYD 1:** In order to maintain bank stability in the area of the new bridge across Suisun Creek, riparian trees to be removed shall be cut above grade and the tree stumps shall be left in place. Tree removal and any other necessary limb cutting shall be conducted under the supervision of a certified arborist. To minimize re-sprouting, all stumps shall be painted with Round-up, or a similar product, by a licensed pest control applicator.

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Impact Category	Impact	Proposed Avoidance, Compensation, and Minimization Measures
Geology/Soils	**Impact GEO 1:** Movement along one or more of faults will result in at least one moderate to major earthquake, resulting in strong seismic shaking within the project area during the lifetime of the proposed project.	**Mitigation Measure GEO 1:** The potential for strong seismic ground shaking shall be taken into account in the design of structures along the subject alignment in accordance with the current seismic design codes.
	Impact GEO 2: The potential for ground rupture and possible shearing within the West End is high.	**Mitigation Measure GEO 2:** To minimize potential structural distress, the project shall be designed and constructed according to the most current earthquake resistance standards for Seismic Zone 4, as outlined in the current Uniform Building Code.
	Impact GEO 3: The potential for liquefaction, lateral spreading or lurching to occur is considered to be moderate in the area along Red Top Road.	**Mitigation Measure GEO 3:** The potential for and the resulting effects of liquefaction and compressible soils shall be further evaluated by the design team prior to finalizing the design and layout of the proposed roadway.
	Impact GEO 4: There is a moderate potential for liquefaction in the East End during seismic events.	**Mitigation Measure GEO 4a:** Any new bridges/overcrossing structures shall be supported upon a deep foundation system, which extends through the potentially liquefiable zones and bears upon the underlying dense gravelly layers.
		Mitigation Measure GEO 4b: The potential for lateral spreading or lurching is considered to be low to moderate. However, the potential for and the resulting effects of liquefaction soils shall be further evaluated by a qualified geologist prior to finalizing the design and layout of proposed roadway.
	Impact GEO 5: The West End of the North Connector is in an area where large landslides have and can continue to occur.	**Mitigation Measure GEO 5:** Existing landslides and the potential for inducing landsliding by grading weak soil, colluvial and bedrock materials shall be taken into account in the design of the proposed grading for the project. In addition, geologic mapping and soil/rock borings shall be conducted as part of these investigations.
	Impact GEO 6: Inadequate fill material can lead to soil instability and erosion. The on-site bedrock-derived materials, existing fills, and native soils within the project area can be used as general fill throughout the project, provided they do not contain more the 3% organic material. Higher organic content in soil mixtures may be permissible in landscape areas. As a result, the use of on-site soils for fill could result in a potentially significant impact.	**Mitigation Measure GEO 6a:** General fill materials (within 5 vertical feet of proposed improvements) shall generally contain rock fragment no larger than 6 inches in maximum diameter. Placement of larger rock fragments or oversized material is possible at the discretion of the project Geotechnical Engineer or Engineering Geologist in deeper fills, provided that the large fragments are not nested and proper compaction can be achieved. Select fill should have a Plasticity Index of less than 15, a Liquid Limit of less than 40, maximum aggregate size of 4

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		inches and have 15% to 60% of the material passing the No. 200 sieve. It is possible that select fill could be generated from portions of the basalt, sandstone and some select tuff layers.
		Mitigation Measure GEO 6b: Due to the moderate to highly expansive nature of some materials that will be generated as fill, exposed within cut slopes, or present within the subgrade of the proposed alignment, for planning purposes new cut and fill slopes shall be planned for gradients no steeper that 3:1. Steeper slopes, if required, shall necessitate further investigation, testing, and analysis in order to develop adequate slope design criteria and possible engineered solutions for steeper slopes. Such solutions may include: fill slope construction with select fill; engineered slopes with geotextile reinforcements; soil improvement additives such as lime; the use of retaining walls; or, a combination thereof.
		Mitigation Measure GEO 6c: In general, fills on slopes steeper than 6:1 shall require construction of keyways and benches with sub-drains. Fill and cut slopes shall be constructed in accordance with Caltrans guidelines and be designed with appropriate surface drainage collection facilities and benching for slopes greater than 30 feet in height.
		Mitigation Measure GEO 6d: Existing undocumented fills within the proposed alignment shall be removed for their full depth and replaced with compacted engineered fill. Earthen fill materials that do not contain more than 3 percent organics can be re-used as general fill. Organic-rich fill should not be used in areas of proposed roadway or other improvements.
	Impact GEO 7: There is the potential for differential settlement resulting from differential fill thicknesses across the project area (West, Central and East), especially existing steep hill slopes.	**Mitigation Measure GEO 7:** Special consideration shall be given to fill placement techniques in order to minimize the settlement potential of the deep fills. Such techniques may include: increasing relative compaction to a minimum of 95 percent (versus the standard 90 percent); surcharging the fills with additional load and later removal; dynamic compaction; use of geotextiles; or a combination thereof.
	Impact GEO 8: The West End Alignment will have slopes and some of the on-site materials are expansive and prone to creep, which is the slow downhill	**Mitigation Measure GEO 8**: Maintenance, repair, and/or occasional replacement of the slopes and/or improvements shall be provided for on a yearly basis for the lifetime of the project. Other

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	movement of soils and weathered bedrock due to gravity.	engineering solutions may also be required to reduce the potential for creep.
	Impact GE0 9: Groundwater may be encountered at relatively shallow depths in the vicinity of Jameson Creek and in areas Suisun Creek. Seepage within cutslopes is a concern with respect to erosion and stability of the cutslope face. This is a potentially significant effect in the West End of the project area where cuts and fills will be necessary to construct the new roadway and improvements to the State Route 12/Red Top Road intersection.	**Mitigation Measure GEO 9a:** Special dewatering procedures for utilities or deep foundations, depending on the time of year of construction, may be required. Special considerations to collect and control seepage, especially at material contacts/faults may be required.
		Mitigation Measure GEO 9b: Each proposed cut area shall be evaluated for material stability and excavatibility, including providing recommended stable slope inclinations. The investigation shall include at lease one soil/rock boring and a seismic refraction line per cut area. Borings shall extend to a minimum of 3 meters (10 feet) below depth of proposed cut.
		Mitigation Measure GEO 9c: Specific recommendations shall be provided for construction and monitoring fill construction including staged construction, if required. Minimum of two soil borings and/or cone penetrometer tests (CPTs), and one observation well are suggested for the Business Center Drive transition fill area.
Air Quality	**Impact AIR1 Construction Emissions:** Temporary increases in construction-related PM10 emissions would occur during grading and construction activities.	**Mitigation AIR1** The contractor shall be required to minimize or eliminate dust through the application of water or dust palliatives during construction and must use Caltrans Special Provisions and Standard Specifications, which include requirements to minimize or eliminate dust through the application of water or dust palliatives during project construction.
Biology	**Impact BIO1:** The project would require the removal of approximately 85 native California trees and Heritage trees, as defined in the Fairfield City Code (Chapter 25, Section 25.36 through 25.38). The trees to be removed consist of approximately 7 Buckeye, 22 Willows, 2 Box Elder, 5 Walnut, 45 Oaks and 4 Bay trees. Tree and riparian habitat removal would be required at the following project locations: the proposed road crossing over Suisun Creek would result in removal of riparian habitat, and the proposed road widening at Red Top	**Mitigation Measure BIO1:** A formal tree survey was conducted to determine the final number of heritage trees and California native trees (with a DBH greater than 6 inches) that would be impacted by the project. A Creek Revegetation and Enhancement Plan have been prepared which mitigates the impacts to California native trees. Each species of tree impacted by the project shall be replaced at a ratio of 3:1 (i.e., 3 trees of the same species will be replaced for every tree impacted). Replanting of native trees shall occur along Suisun Creek in areas where native trees would naturally occur, and in areas that can support more trees.

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	Road south of Highway 12 would result in removal of riparian habitat, along two unnamed creeks. Removal of California native trees (such as native oaks, buckeye, bay laurel, and madrone) that are greater than 6 inches DBH (diameter at breast height), or heritage trees, would be considered an adverse biological impact.	An irrigation system shall be installed in the tree mitigation area along Suisun Creek that will be maintained for three years, or until the trees have become established. Monitoring of tree survival shall be conducted for five consecutive years. Annual monitoring reports shall be submitted to the involved resource agencies.
	Impact BIO2: Waters of the United States and State: As proposed, the project alignment in the West End of the project area would impact 0.64-acre of waters of the United States and State. This acreage includes impacts to 642 linear feet (196 meters) (0.07-acre) of "other waters," and impacts to 0.57-acre of seasonal wetlands. These impacts would be considered an adverse biological impact.	**Mitigation Measure BIO2:** Prior to impacting waters of the United States, an Individual Permit application and alternatives analysis shall be submitted to the Corps, pursuant to the 404 of the Clean Water Act. The Corps permit application will include a Mitigation and Monitoring Plan addressing impacts to waters of the United States, including wetlands. In addition, a permit should be issued by the RWQCB pursuant to Section 401 of the Clean Water Act. Impacts to 0.57-acre of seasonal wetland habitat and 0.07-acre of other waters that will be impacted at the West End of the project area will be mitigated by creating a 1.5-acre breeding pond for California red-legged frog that will provide seasonal wetland habitat. Additional mitigation for impacts to waters of the U.S./State will be mitigated through the proposed creation of additional 0.3-acre of seasonal wetlands, as shown in Figure I.2. This will provide approximately 3:1 mitigation for impacts to waters of the U.S./State. Additional mitigation for impacts to waters of the U.S./State will include creek enhancement and preservation of existing wetlands and creek corridors in the project vicinity as approved and required by the agencies. The applicant will place all preserved wetlands in a perpetual Grant of Easement that usurps all development rights. No further development, establishment of utilities, or any construction of any kind will be allowed within the dedicated open space preserve. The Grant of Easement shall designate Solano County as the grantee of the open space easement. A riparian mitigation area has been identified along Green Valley Creek that will provide creek enhancement. This mitigation measure would reduce impacts to waters of the United States, and impacts to waters of the State, to a level considered less than significant.
	Impact BIO3: Pacific pond turtle: The pacific pond turtle is a state species of special concern. Pacific pond turtles are found in the ponds located in the West End of the study area north of SR12 and in the ornamental ponds in the business park. The proposed project would not result in impacts to aquatic habitat; however, potentially occupied upland burrow sites may be impacted	**Mitigation Measure BIO3:** Since avoidance of potentially occupied upland burrow sites is not possible, mitigation would include preserving affected upland habitat within 1000 feet of the pond located in the West End of the study area at a 1:1 ratio, or as otherwise determined mutually by the STA and the resource agencies. Land identified to mitigate impacts to Pacific pond turtle would be protected in perpetuity either by a conservation easement or via fee title

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	by the proposed project. Impacts to this species would therefore be considered potentially adverse.	acquisition.
	Impact BIO4: Nesting Raptor: A red-tailed hawk (Buteo jamaicensis) was observed displaying territorial behavior over a eucalyptus tree located in the West End of the study area north of SR12. If tree removal or ground disturbance is proposed between March 1st and September 1st nesting raptors, such as Cooper's hawk, golden eagle, western burrowing owl, short-eared owl, white-tailed kite, and northern harrier could be impacted. Birds and their nests are protected under California Fish and Game Code (Sections 3503, 3503.5), and the Migratory Bird Treaty Act. Impacts to nesting raptors, their eggs, and/or young are regarded as a potentially adverse.	**Mitigation Measure BIO4**: In order to avoid impacts to nesting raptors, a nesting survey should be conducted 15 days prior to commencing with construction work if this work would commence between March 1st and September 1st. The raptor nesting surveys should include examination of all trees within 1000 feet of the entire proposed construction corridor, not just trees slated for removal. Nesting surveys should be conducted in the spring the year prior to construction of the project, and again 15 days prior to construction of the project. [See pg. 2.13-16 through 2.13-18 for complete mitigation requirement]
	Impact BIO5: Nesting Passerine and Special Status Bird Species: If tree removal or ground disturbance is proposed between the months of March 1st and September 1st, nesting passerine birds, and special-status birds such as grasshopper sparrow, loggerhead shrike, and tricolored blackbirds could be impacted. Birds and their nests are protected under California Fish and Game Code (Sections 3503, 3503.5), and the Migratory Bird Treaty Act. Impacts to nesting birds, their eggs, and/or young are regarded as a potentially adverse.	**Mitigation Measure BIO5**: In order to avoid impacts to common nesting birds and special-status birds, a nesting survey should be conducted 15 days prior to commencing with construction work if this work would commence between March 1st and September 1st. Nesting surveys should be conducted throughout the entire construction corridor in the spring the year prior to construction of the project and again 15 days prior to construction of the project. If special-status birds, such as loggerhead shrike or tricolored blackbird, are identified nesting within the area of affect, a 200-foot radius around the nest should be staked with bright orange spray painted lath or other suitable staking. No construction or earth-moving activity should occur within this 200-foot staked buffer until it is determined by a qualified biologist that the young have fledged and have attained sufficient flight skills to avoid project construction zones. This typically occurs by August 1st, but may occur earlier or later, and would have to be determined by a qualified biologist. If common passerine birds such as American robins, scrub jays, and northern mockingbird are identified nesting in the trees proposed for removal, tree removal should be postponed until it is determined by a qualified ornithologist that the young have fledged and have attained sufficient flight skills to leave the study area. Typically, most passerine birds can be expected to complete nesting by July 1st, with young attaining sufficient flight skills by early July.

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	Impact BIO6: Special Status Bats: The pallid bat is a state species of special concern, and the Yuma myotis bat is a federal species of concern. These bats may utilize trees or other potential roost structures found within the study area. Impacts to occupied roost trees or structures would be considered potentially adverse.	**Mitigation Measure BIO6:** Preconstruction surveys should be conducted before trees or potential roost structures are impacted or removed within the entire study area. A biologist with experience conducting bat surveys should conduct this survey. If no bats are found during the survey, tree removal and structure demolition work shall be conducted within one month of the survey. If a maternity colony is observed during the surveys, no eviction/exclusion should be allowed during the maternity season (typically between April 15 and July 30). If a non-reproductive group of bats are found within a building or roost tree, they should be evicted by a qualified biologist and excluded from the roost site prior to work activities during the suitable time frame for bat eviction/exclusion (i.e., February 20 to April 14 and July 30 to October 15).
	Impact BIO7: Valley Elderberry Longhorn Beetle: This species is known to occur in elderberry shrubs along the eastside of Green Valley Road, north and south of the intersection with Business Center Drive, which is in proximity to the study area. The elderberry trees/shrubs along Suisun Creek provide potential habitat for valley elderberry longhorn beetle. This beetle is a federally listed threatened species. A total of 12 elderberry plants will be affected, which include 37 stems greater than 1 inch but less than 3 inches, and 6 stems greater than 3 inches but less than 5 inches. Removal or damage to elderberry trees/shrubs potentially supporting valley elderberry longhorn beetles is considered potentially adverse.	**Mitigation Measure BIO7:** Valley elderberry longhorn beetle habitat was identified along Suisun Creek. Several of the elderberry trees/shrubs present along Suisun Creek had appropriately-sized beetle exit holes indicating past use by valley elderberry longhorn beetle. Suitable habitat will be avoided and preserved to the extent feasible. Complete avoidance, resulting in no adverse effects, will be assumed outside the 100-foot buffer that will be established from the edge of the proposed bridge alignment over Suisun Creek and the preserved elderberry plants. Protection measures detailed in the U.S. Fish and Wildlife Service's Conservation Guidelines for Valley Elderberry Longhorn Beetle (USFWS 1999) will be implemented. All preserved plants will be fenced off and these areas will be designated as avoidance areas that will be protected from disturbance during construction of the bridge. In addition, restoration and maintenance measures detailed in the U.S. Fish and Wildlife Service's Conservation Guidelines for Valley Elderberry Longhorn Beetle (USFWS 1999) will be implemented to restore any damage done to the 100-foot buffer area during construction. These areas will be re-vegetated and appropriate erosion control measures will be installed. [See pg. 2.13-25 through 2.13-26 for complete mitigation requirement]
	Impact BIO8: Steelhead: NMFS has records of steelhead presence in Suisun Creek, as it is suitable habitat. The proposed project, as currently designed, would not result in direct impacts to Suisun Creek. A clear span bridge design is proposed over Suisun Creek to minimize impacts to steelhead and steelhead habitat; however, riparian habitat would be removed. This may result in impacts to habitat that supports this fish species. Impacts to this	**Mitigation Measure BIO8:** A clear span bridge design is proposed over Suisun Creek to minimize impacts to steelhead and steelhead habitat; however, bridge construction will require the removal of riparian vegetation. Removal of riparian trees could affect known steelhead habitat. To minimize potential impacts to steelhead, riparian tree removal and bridge construction will be conducted between June 15 and October 15, when steelhead are not expected to be in this reach of Suisun Creek.

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	species are regarded as potentially adverse.	Tree removal and any other necessary limb cutting will be conducted under the supervision of a certified arborist. To minimize re-sprouting, all stumps will be painted with Round-up, or a similar product, by a licensed pest control applicator. During a pre-project meeting with NMFS on March 18, 2004, various mitigation options were discussed to compensate for this potential impact to steelhead and its habitat. Riparian trees removed for this project will be replaced at a ratio of 3:1 (three trees of the same species will be replanted for every tree removed). Riparian planting will be conducted along Suisun Creek. A creek re-vegetation and enhancement plan has been prepared for this project to address impacts to riparian trees. Mitigation for impacts to native trees was further discussed earlier in this section. In addition, Best Management Practices (BMPs) will be employed during construction to minimize and/or prevent water quality impacts to Suisun Creek. Silt fencing will be installed along the top-of-bank to prevent sediment or construction materials from rolling down the banks. In addition, a hammock, or similar material, will be deployed over the creek during construction to capture any construction debris that could fall into the creek.
	Impact BIO9: California Red Legged Frog: The California red-legged frog is a federally listed threatened species and a state species of special concern. Protocol-level surveys were conducted for California red-legged frogs along Dan Wilson Creek and Suisun Creek. No California red-legged frogs were observed during the diurnal or nocturnal surveys along either creek. In May 2003, one California red-legged frog adult was observed in the West End of the study area north of SR12 at the edge of a plunge pool in one of the unnamed drainages. A juvenile California red-legged frog was observed in the same drainage in March 2004. Construction of the road could result in impacts to California red-legged frogs and/or its habitat. Impacts to California red-legged frog, larvae, or occupied habitat are considered an adverse effect.	**Mitigation Measure BIO9:** The proposed roadway alignment through the West End of the project area cannot be adjusted due to site topography and other engineering constraints. Consequently, occupied and potentially occupied California red-legged frog habitat will be impacted by the proposed project. Approximately 0.59-acre of seasonal wetlands and seeps at the West End of the project area will be impacted by the proposed project. This frog has been observed on at least two occasions in a drainage feature at the West End of the North Connector Project. While the drainage known to support California red-legged frogs will not be filled by the project, 0.59-acre of other drainage features, seasonal wetlands and seeps within the West End of the project area that may also provide habitat for California red-legged frogs will be impacted by the proposed roadway and associated grading activities. Finally, this frog is known to occur in the large stock pond at the West End of the project area. This pond will not be directly affected, although uplands surrounding occupied habitat will be impacted by the proposed project. It is estimated that 17.7 acres of upland habitat that provides dispersal habitat for California red-legged frogs will be impacted by the proposed roadway and associated grading activities. [See pg. 2.13-28 through 2.13-29 for complete mitigation requirement]

Table Appendix D-1: Summary of Impacts and Proposed Mitigation Measures

Impact Category	Impact	Proposed Avoidance, Compensation, and Minimization Measures
Community Impacts	**Impact COM 1:** The alignment in the East End would result in the displacement of one business – a concrete installation company, located in the Del Monte Warehouse, on a 1.2-acre parcel at 4974 Russell Road, which includes an 8,800-square-foot warehouse and a 5,300-square-foot pole barn. Relocation of a business can result in unemployment and associated financial impacts. The proposed action would not have a substantial affect on the local economy because the business that would be displaced is not a major employer in Solano County. If the company can relocate within the same area and remain viable, the effects of unemployment would be temporary. It is expected that the business would be able to relocate within the area.	**Mitigation Measure COM 1:** Under Public Law 91-646, the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, displaced individuals and businesses must receive fair and humane treatment and shall not suffer unnecessarily as a result of project designed for the benefit of the public. Property owners must be compensated at fair market value for the land and structure. The property owners in the East End would be entitled to full market land and structure value as a result of the proposed take.
Hazardous Waste/Materials	**Impact HAZ 1**: Yellow thermoplastic and yellow paint used for pavement markings throughout the project area may contain lead in excess of hazardous waste thresholds. Structures at and adjacent to the project area constructed prior to 1980 may also have the potential to contain lead-based paint and asbestos-containing building materials.	**Mitigation Measure HAZ 1:** The presence of lead and asbestos shall require abatement and/or special construction worker health and safety procedures during demolition activities.
	Impact HAZ 2: Soils within Caltrans rights-of-way that would be disturbed during construction may contain aerially deposited lead from vehicle exhausts.	**Mitigation Measure HAZ 2:** Soils shall be routinely tested for total and/or soluble lead to properly classify the soils and ensure that all necessary soil management and disposal procedures are followed.
	Impact HAZ 3: Soils near a railroad track will be disturbed.	**Mitigation Measure HAZ 3:** A minimum of four soil samples from soils immediately beneath railroad tracks shall be taken. These samples shall be analyzed for Title 22 metals, total petroleum hydrocarbons (TPH), semi-volatile organic compounds (SVOCs), and polychlorinated biphenyls (PCBs).
	Impact HAZ 4: Implementation of the proposed project would require excavation to the depth of groundwater at locations where reported hazardous	**Mitigation HAZ 4:** An investigation of groundwater quality shall be conducted during the detailed design phase in areas where reported hazardous materials releases may have occurred

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	materials releases may have affected the project area.	and where excavation would reach groundwater levels.
	Impact HAZ 5: Land that has previously been under agricultural cultivation has the potential to be contaminated with hazardous materials. Construction in the West End would expose soils previously used in agriculture.	**Mitigation Measure HAZ 5:** During detailed design, a minimum of eight four-point composite samples from areas historically under agricultural cultivation shall be collected and analyzed for Title 22 metals and organochlorine pesticides.
	Impact HAZ 6: Agricultural outbuildings may potentially be associated with hazardous material use because agricultural chemicals may have been used, stored, or mixed in the area. In addition, above-ground or underground storage tanks may have existed in West End agricultural areas.	**Mitigation Measure HAZ 6:** A qualified environmental professional shall take a minimum of four soil samples from areas adjacent to each agricultural outbuilding affected by the project. These samples shall be analyzed for Title 22 metals, organochlorine pesticides, and total petroleum hydrocarbons (TPH) as gasoline, diesel, and motor oil. If evidence of contaminated soil results from the sampling, further remediation would be conducted.
Water Quality	**Impact WQ 1:** Construction activities can impair water quality temporarily due to the potential for sediment, petroleum products, construction materials, and miscellaneous wastes to be discharged into receiving waters or the storm drainage system. Soils and associated contaminants that enter stream channels can increase turbidity, stimulate growth of algae, increase sedimentation of aquatic habitat, and introduce compounds that are potentially harmful or toxic to aquatic organisms. Construction materials such as fuels, oils, paints, and concrete are potentially harmful to fish and other aquatic life if released into the environment. The extent of the potential impacts related to construction activities depends on the erodability of soil types encountered, type of construction activities, extent and duration of disturbed area, timing of precipitation, proximity to drainage channels, and BMP implementation. However, due to the nature and the topography of the project area, the potential for short-term water quality impacts from erosion and pollutant discharges would be expected to be fully mitigated using appropriate BMP methods.	**Mitigation Measure WQ 1a:** The project shall adhere to the conditions of the National Pollutant Discharge Elimination System (NPDES) Permit, including the C.3 requirements for stormwater discharge treatment measures and appropriate source control and site design measures. To avoid potential long term impacts to water quality the project will be designed to include bioswales to retain and treat stormwater runoff from the roadway before entering the City's stormwater drainage system. To comply with temporary water quality impact resulting from construction activities, a Storm Water Pollution Prevention Plan (SWPPP) will be prepared prior to grading activities. The SWPPP must list Best Management Practices (BMP's) that will be followed minimize contaminants entering storm drains as a result of storm runoff. Treatment BMPs that have been approved for use as treatment by the SWRCB and include: Biofiltration strips and swales, Infiltration basins, Detention devices, Dry weather flow diversions, Gross solid removal devices, Media Filters Multi-chamber Treatment Trains Wet Basins

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		One or a combination of the above-mentioned treatment BMPs may be implemented prior to construction. However, at the current level of design, it is not possible to identify location-specific BMPs in the environmental document. It would be necessary to identify these location-specific BMPs in the SWPPP prepared by the contractors prior to construction.
		Mitigation Measure WQ1b: In addition to soil materials, asphalt, concrete, and cement material discussed above, during SWPPP development, the contractor shall be required to identify all potential pollutants from construction activities. It is expected that implementation of BMPs would fully mitigate any impacts of construction of the project on receiving water quality. Implementation of BMPs would fully mitigate any water quality impacts from project construction activities.
	Impact WQ 2: The potential pollutants during facility operation are primarily dependent upon the type of facility being constructed. For example, a new alignment as proposed in this project will increase the amount of impervious surface area available for contact with stormwater runoff (wet and dry weather flows). This type of project would result in a modest increase in stormwater runoff and an increased potential for stormwater pollution. The existing storm drainage system for I-80 and many of the other surface roadways in the project vicinity were designed and installed prior to recent and stringent water quality standards. The proposed project would improve functional aspects of the storm drainage system. Specifically, the proposed project would provide the opportunity to incorporate pollution prevention and treatment BMPs to reduce existing areas of erosion and remove pollutants from stormwater discharges. The proposed project would also provide the opportunity to repair existing areas of erosion, especially at the surface water crossing locations. Any impacts to water quality from the long-term operation of the project would be expected to be fully mitigated by implementation of applicable BMPs.	**Mitigation Measure WQ 2**: Implementation of BMPs would fully mitigate any water quality impacts associated from changes in stormwater drainage.